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DATE MAILED: 08/08/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 09/469,122	Applicant(s) LEMMI ET AL.	
	Examiner Chris C. Chu	Art Unit 2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1 - 26 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1 - 26 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 21 December 1999 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

On page 2, line 18, "11inch-long" should be --11 inch-long--.

On page 20, line 26, "sensors 34, 34', 53, 68, 70" should be --sensors 34, 34', 53--.

Because reference number "68 and 70" are not sensors.

Appropriate correction is required.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "10" has been used to designate both chip and laser printbar. Correction is required.

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the physical contact between the light source and the micro-spring interconnects and the physical contact between the micro-spring interconnects and the driver chips must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

4. Applicant is required to submit a proposed drawing correction in reply to this Office action. However, formal correction of the noted defect can be deferred until the application is allowed by the examiner.

Claim Objections

5. Claim 13 is objected to because of the following informalities:

Line 2, "n+doped" should be --n+ doped--.

Line 7, "p+doped" should be --p+ doped--.

Line 8, "p+boron-doped" should be --p+ boron-doped--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 22 – 26 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

In claim 22, most and detailed invention shown in Fig. 10 is not clear how each of the element communicates with each other, since the micro-spring interconnect structure terminates

short of elements. For instant how is the signal moves from the sensor to the driver chip which in term drives the light source. Furthermore, the invention is unclear since there is no clear top view of the invention and the specification fails to disclose the electrical connection between the sensor, driver chip, and the light source. Therefore, all of the claimed elements and the relationships therebetween must be described in the specification or this claim cancelled from this instant invention. No new matter should be entered.

In claim 26, Fig. 5e of the instant invention shows that the free portion of the micro-spring interconnect structure has a limitation in the length. According to Fig. 5e, the instant invention can be made as possible as shown in Fig. 4, Fig. 10, or Fig.11. Therefore, all of the claimed elements and the relationships therebetween must be logically described in the specification or this claim cancelled from this instant invention. In other words, the examiner request, a width and weight of the LED or light source, a width and length of the free portion of the micro-spring interconnect, a width of the sensor, an ideal distance between sensor and the LED or light source and a length of the substrate. The number doesn't have to be specific. This requesting numbers are only for the exam purpose only. No new matter should be entered.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1 ~ 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1 and 17, it can not be determined what the applicant regards as the "an elastic material that is initially fixed to a surface on the substrate." Further, the phrase "initially fixed" is not defined in the specification, therefore, "initially fixed" must be defined in the specification or the phrase cancelled from the claim. No new matter should be entered.

The claims 1, 17, 22, and 26 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: a wire or metal layer or some kind of interconnection between the sensor and the micro-spring interconnection; and, supporters for each of the driver chips. No new matter should be entered. Further, claims 1, 17, 22, and 26 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: a relationship between the sensor and the micro-spring interconnect structure; and a relationship between the length of free portion of the micro-spring interconnect structure (60a-n in Fig. 5e) and a distance between the light source and the sensor. Because, the examiner is not sure how the free portion of the micro-spring interconnect structure will be attached to the light source.

The term "high" in claim 24 is a relative term, which renders the claim indefinite. The term "high" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1 ~ 8, 10, 11, 17 ~ 22, 25, and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Ogura et al.

Note Fig. 23B of Ogura et al., where the reference shows a hybrid device comprising: a substrate (2); a micro-spring interconnect (9) formed on the substrate, the micro-spring interconnect including, an elastic material (column 10, lines 38 ~ 45) that is initially fixed to a surface on the substrate including, an anchor portion fixed to the substrate, and a free portion (see Fig. 23B); and a sensor (1) formed on the substrate, the sensor including an active layer and contacts (see Fig. 10A and Fig. 23B), said active layer being capable of sensing light, said micro-spring interconnect and said sensor being integrated on the substrate (see Fig. 23B). Further, the phrase "the sensor including an active layer and contacts" is structure inherent. Even further, the phrase "said active layer being capable of sensing light" has been held that the recitation that an element is "capable of" performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. In re Hutchison, 69 USPQ 138.

Regarding claim 2, note Fig. 10A of Ogura et al., where the reference shows the hybrid device further includes at least one of a single light source (3), an array of lasers, and an array of

light emitting diodes (LEDs) (column 1, lines 47 ~ 48), positioned to emit light at least partially through a portion of the sensor (see Fig. 10A).

Regarding claim 3, Ogura et al. discloses the sensor is designed and aligned with at least one of the laser array and the LED array, to receive emitted light from at least one of, some of the lasers of the laser array and some of the LEDs of the LED array (see Fig. 10A).

Regarding claim 4, Ogura et al. discloses the sensor is designed and aligned with at least one of the laser array and the LED array to receive emitted light from a portion of at least one of the laser array and the LED array (see Fig. 10A).

Regarding claim 5, Ogura et al. discloses the substrate is designed and aligned with at least one of the laser array and the LED array to receive emitted light from a portion of at least one of the laser array and the LED array (see Fig. 10A).

Regarding claim 6, Ogura et al. discloses the sensor is an array of sensors (column 17, lines 30 ~ 33).

Regarding claim 7, Ogura et al. discloses the substrate and the active layer of the sensor at least partially transparent at selective wavelengths (column 16, lines 45 ~ 46).

Regarding claim 8, Ogura et al. discloses the sensor (1 in Fig. 23B) and the micro-spring interconnect (9 in Fig. 23B) are comprised of materials which allow for integration of the micro-spring interconnect and the sensor on the single substrate during a manufacturing process (see Fig. 23B), wherein at least one of the materials for the micro-spring interconnect and the sensor is the same (6 in Fig. 16 and column 9, lines 63 ~ 67, column 10, lines 1 ~ 8 and column 10, lines 38 ~ 39).

Regarding claim 10, Ogura et al. discloses the elastic material fixed to the substrate is held by the passivation/release layer (column 10, line 43), which is interposed between the substrate and the elastic material (column 10, lines 38 ~ 45). Further, it is well known in the art that "epoxy or silicone resin" is well known material for the passivation/release layer.

Regarding claim 11, Ogura et al. discloses the elastic material is a stressed metal layer having sub-layers of differing stress gradients (see 9 in Fig. 23B), whereby when released from the passivation/release layer, the released portion moves out of a plane of the substrate. Further, the term "the elastic material" is a part of the micro-spring interconnect, which contains metal layer and nonmetal layer. Therefore, applicant should note that the phrase "the elastic material is a stressed metal layer having sub-layers of differing stress gradients" is inherent. Furthermore, it has been held that the functional "whereby" statement does not define any structure and accordingly can not serve to distinguish. In re Mason, 114 USPQ 127, 44 CCPA 937 (1957).

Regarding claim 17, note Fig. 10A of Ogura et al., where the reference shows a hybrid device comprising: at least one of a laser (3) or LED device capable of emitting light at a certain wavelength; a substrate (2); a micro-spring interconnect (9 in Fig. 23B) formed on the substrate the micro-spring interconnect including, an elastic material (column 10, lines 38 ~ 45) that is initially fixed to the substrate, an anchor portion fixed to the substrate, and a free portion (see Fig. 23B); and a sensor (1) formed on the substrate, in an integrated manner, with the micro-spring interconnect, the sensor including an active layer and contacts (see Fig. 23B), wherein said substrate, and said sensor are at least partially transparent to light at the wavelength emitted by at least one of the laser or the LED device (column 16, lines 45 ~ 46); and said at least one of the laser or the LED device and said substrate with said sensor and said at least one micro-spring

interconnect being separately fabricated and aligned, such that at least a portion of the light emitted by the at least one of the laser and LED device is directed through at least a portion of the substrate and the sensor. Further, the phrase "the sensor including an active layer and contacts" is structure inherent. Even further, the phrase "at least one of a laser or LED device capable of emitting light at a certain wavelength" has been held that the recitation that an element is "capable of" performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. In re Hutchison, 69 USPQ 138. Furthermore, as to the language on lines 17 ~ 21, "said at least one of the laser or the LED device and said substrate with said sensor and said at least one micro-spring interconnect being separately fabricated and aligned, such that at least a portion of the light emitted by the at least one of the laser and LED device is directed through at least a portion of the substrate and the sensor", applicant should note that this is merely "result or function" language which cannot be relied upon to define over Ogura et al., since Ogura et al. discloses all of the claimed elements and their recited relationships. Moreover, the examiner will presume that the recited results are inherent in Ogura et al., since all of the claimed elements and the relationships therebetween are met by Ogura et al. If the recited result or function is not inherent in Ogura et al., then this would mean that applicant has failed to recite one or more critical features of the present invention (i.e., a problem under 112, first paragraph).

Regarding claim 18, Ogura et al. discloses at least a portion of the laser or the LED device is a plurality of lasers or LEDs formed in a laser or LED array (column 1, lines 47 ~ 48).

Regarding claim 19, Ogura et al. discloses the sensor is sized such that each of the lasers or LEDs emit light at least partially through the sensor (see Fig. 10A).

Regarding claim 20, Ogura et al. discloses the sensor is a plurality of sensors (column 17, lines 30 ~ 33), sized such that a sub-group of the lasers or the LEDs may emit light through selected ones of the of sensors (see Fig. 10A).

Regarding claim 21, Ogura et al. discloses the lasers or LEDs are arranged as a printbar, and the micro-spring interconnect is in electrical contact with the printbar (see Fig. 23B).

Regarding claim 22, note Fig. 10A of Ogura et al., where the reference shows a calibration/printing system comprising: a sensor configuration including a sensor element (1) integrated on a substrate (2) with a plurality of micro-spring interconnects (9 in Fig. 23B); a light source (3) aligned with the sensor configuration such that at least a portion of the light from the light source is sensed by the sensor and at least a first of the micro-spring interconnects is in physical contact with a portion of the light source; a driver chip (IC in Fig. 23B) aligned with the sensor configuration and the light source such that at least a second of the micro-spring interconnects is in physical contact with a portion of the driver chip (see Fig. 23B), whereby a communication path is formed between the light source and the driver chip by the at least first and second micro-spring interconnects. Further, the phrase "a light source aligned with the sensor configuration such that at least a portion of the light from the light source is sensed by the sensor and at least a first of the micro-spring interconnects is in physical contact with a portion of the light source" is structure inherent. Furthermore, it has been held that the functional "whereby" statement does not define any structure and accordingly can not serve to distinguish. In re Mason, 114 USPQ 127, 44 CCPA 937 (1957).

Regarding claim 25, Ogura et al. discloses the light source (3 in Fig. 10A) is a printbar having an array of light sources (column 1, lines 47 ~ 48), and wherein the printbar is controlled

to activate the light sources in a sequential manner to obtain calibration data to be stored in the driver (see Fig. 23B).

Regarding claim 26, note Fig. 10A of Ogura et al., where the reference shows a hybrid device comprising: a micro-spring interconnect structure (9 in Fig. 23B); and at least two devices electrically connected (see Fig. 23B) by the interconnect structure wherein, one of the devices is a sensor (1), the sensor including an active layer and contacts, said active layer being capable of sensing light, and another one of the devices is at least one of a single light source (3 in Fig. 10A), an array of lasers, and an array of light emitting diodes (LEDs), positioned to emit light at least partially through the sensor (see Fig. 10A). Further, the phrase "the sensor including an active layer and contacts" is structure inherent. Even further, the phrase "said active layer being capable of sensing light" has been held that the recitation that an element is "capable of" performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. In re Hutchison, 69 USPQ 138.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 9, 12, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogura et al. in view of Yamazaki et al.

Ogura et al. discloses the claimed invention except for the sensor is comprised of, a first transparent/conductive layer; an active layer on top of the first transparent/conductive layer; a second transparent/conductive layer on top of the active layer; a passivation/release layer located over at least the first transparent/conductive layer and the second transparent/conductive layers; and a metal layer connecting to the first and second transparent/conductive layers through the vias, wherein the metal layer acts as signal lines to receive and carry signals from the active layer. However, note Fig. 2(D) of Yamazaki et al., where the reference shows that the sensor is comprised of, a first transparent/conductive layer (2); an active layer (3) on top of the first transparent/conductive layer (see Fig. 2(D)); a second transparent/conductive layer (23) on top of the active layer (see Fig. 2(D)); a passivation/release layer (21) located over at least the first transparent/conductive layer and the second transparent/conductive layers (see Fig. 2(D)); and a metal layer (5) connecting to the first and second transparent/conductive layers through the vias, wherein the metal layer acts as signal lines to receive and carry signals from the active layer. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Ogura et al. by including the sensor is comprised of, a first transparent/conductive layer; an active layer on top of the first transparent/conductive layer; a second transparent/conductive layer on top of the active layer; a passivation/release layer located over at least the first transparent/conductive layer and the second transparent/conductive layers; and a metal layer connecting to the first and second transparent/conductive layers through the vias, wherein the metal layer acts as signal lines to receive and carry signals from the active layer

as taught by Yamazaki et al. The ordinary artisan would have been motivated to modify Ogura et al. in the manner described above for at least the purpose of eliminating short circuit current paths in the sensor.

Regarding claim 12, Ogura et al., as modified, discloses the sensor further includes an absorption layer, located immediately over the sensor, wherein the absorption layer absorbs unwanted light prior to being detected by the active layer (column 3, lines 31 ~ 47 of Yamazaki et al.).

Regarding claim 13, Ogura et al., as modified, discloses the active layer is a three layer element, wherein a first layer is a n+ doped amorphous silicon, the first layer being one of, but not limited to n+ phosphorous-doped amorphous silicon and n+ arsenic-doped silicon; wherein a second layer is an intrinsic amorphous silicon; wherein a third layer is a p+ doped amorphous silicon, the third layer being, but not limited to, p+ boron-doped amorphous silicon (column 3, lines 11 ~ 21 of Yamazaki et al.). Further, since Yamazaki et al. does not limit the p-type semiconductor layer and crystalline semiconductor layer to any particular or specific semiconductor material, his disclosure encompasses all well known semiconductor layer's including "n+ doped amorphous silicon, n+ phosphorous-doped amorphous silicon, n+ arsenic-doped silicon, p+ doped amorphous silicon, and p+ boron-doped amorphous silicon."

13. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogura et al. in view of Sekiguchi.

Ogura et al. discloses the claimed invention except for a switch is located, between the sensor and the substrate, such that the sensor is an active semi-continuous sensor. However, note

Fig. 6 of Sekiguchi, where the reference shows that a switch (100) is located, between the sensor and the substrate (see Fig. 6), such that the sensor is an active semi-continuous sensor. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Ogura et al. by including a switch between the sensor and the substrate as taught by Sekiguchi. The ordinary artisan would have been motivated to modify Ogura et al. in the manner described above for at least the purpose of increasing efficient utilization of the sensor. Further, as to the language on lines 2 ~ 3, "such that the sensor is an active semi-continuous sensor", applicant should note that this is merely "result or function" language which cannot be relied upon to define over Ogura et al. in view of Sekiguchi, since Ogura et al., as modified, discloses all of the claimed elements and their recited relationships. Moreover, the examiner will presume that the recited results are inherent in Ogura et al., as modified, since all of the claimed elements and the relationships therebetween are met by Ogura et al. in view of Sekiguchi. If the recited result or function is not inherent in Ogura et al., as modified, then this would mean that applicant has failed to recite one or more critical features of the present invention (i.e., a problem under 112, first paragraph).

Regarding claim 15, Ogura et al., as modified, discloses the switch is a thin-film-transistor (TFT) (column 11, line 31 of Sekiguchi).

14. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ogura et al. in view of Yamada et al.

Ogura et al. discloses the claimed invention except for the micro-spring interconnect is a plurality of micro-spring interconnects. However, note Fig. 1 of Yamada et al., where the

reference shows that the micro-spring interconnect is a plurality of micro-spring interconnects (1 - 6). Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Ogura et al. by including a plurality of micro-spring interconnects as taught by Yamada et al. The ordinary artisan would have been motivated to modify Ogura et al. in the manner described above for at least the purpose of increasing speed of the device.

15. Claims 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogura et al. in view of Rajeswaran.

Ogura et al. discloses the claimed invention except for the driver chip further include: a comparator for comparing a sensor readout current from the sensor and a reference current; a converter arrangement which converts the output of the comparator into digital data representing characteristics of the light source; a set of low frequency shift registers configured to receive and store the digital data; an activation signal selectively supplied to the light source to selectively emit light therefrom; a driver designed to interpret the digital data as activation signal correction information for the activation signal; a high frequency shift-register configured to receive and store digital image data from a source external to the driver chip; and an enable/disable output from the high frequency shift-register to selectively supply the activation signal and light source correction information to the light source, whereby an amount of light emitted by the light source is controlled. However, note Fig. 12 of Rajeswaran, where the reference shows that the driver chip further include: a comparator (53) for comparing a sensor readout current from the sensor and a reference current (see Fig. 12); a converter (57) arrangement which converts the output of the comparator into digital data representing characteristics of the light source (column 9, lines

48 ~ 54); a set of low frequency shift registers (52) configured to receive and store the digital data; Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Ogura et al. by including a comparator, a converter, and a registers as taught by Rajeswaran. The ordinary artisan would have been motivated to modify Ogura et al. in the manner described above for at least the purpose of increasing efficient of the device. Further, as to the language on lines 13 ~ 24, "an activation signal selectively supplied to the light source to selectively emit light therefrom; a driver designed to interpret the digital data as activation signal correction information for the activation signal; a high frequency shift-register configured to receive and store digital image data from a source external to the driver chip; and an enable/disable output from the high frequency shift-register to selectively supply the activation signal and light source correction information to the light source, whereby an amount of light emitted by the light source is controlled" applicant should note that this is merely "result or function" language which cannot be relied upon to define over Ogura et al. in view of Rajeswaran, since Ogura et al., as modified, discloses all of the claimed elements and their recited relationships. Moreover, the examiner will presume that the recited results are inherent in Ogura et al., as modified, since all of the claimed elements and the relationships therebetween are met by Ogura et al. in view of Rajeswaran. If the recited result or function is not inherent in Ogura et al., as modified, then this would mean that applicant has failed to recite one or more critical features of the present invention (i.e., a problem under 112, first paragraph). Furthermore, it has been held that the functional "whereby" statement does not define any structure and accordingly can not serve to distinguish. In re Mason, 114 USPQ 127, 44 CCPA 937 (1957).

Regarding claim 24, Ogura et al., as modified, discloses the digital image data from the source external to the driver chip is supplied as high frequency bit stream data (column 7, lines 48 ~ 60).

16. Claims 1, 17, 22, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. in view of U.S. Pat. No. 5,613,861 to Smith et al.

Tanaka et al. discloses the claimed invention except for the micro-spring interconnect. However, note Fig. 6 of Smith et al., where the reference shows that the micro-spring interconnect (15), which including an elastic material (13), an anchor portion (12), and a free portion (11). Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Tanaka et al. by including the micro-spring interconnects as taught by Smith et al. The ordinary artisan would have been motivated to modify Tanaka et al. in the manner described above for at least the purpose of increasing speed and easy of solder bump flip chip (column 2, line 67).

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris C. Chu whose telephone number is (703) 305-6194. The examiner can normally be reached on M-F (9:30 - 6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7382 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Chris C. Chu
Examiner
Art Unit 2815

c.c.
August 3, 2001

EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800